**IT Applications Unit 3, AOS 1, Online Communities**

1. Complete the following, from pgs, 28- 32: **Transmission media**

**Networks are classified according to below and we will study the following:**

1. Network Categories: LAN, WAN
2. Network Architecture, client-server; peer-to-peer; internet peer-to-peer; intranet
3. Network communication standards
4. Network hardware and software
5. **Transmission media**
6. Network security

**Transmission media**

**Physical Transmission**

**Twisted – pair cable**

1. **What is twisted pair cable?**

A UTP (Unshielded Twisted Pair) cable is the most common form of transmission in a star network. They are broken down into various categories, CAT 3 which can carry 10 mbps over 100 metres, CAT 5 carry 10 mbps over 85 metres. CAT 5e can support 1 GB. CAT 6 has more stringent specifications when it comes to noise and has super fast broadband.

1. **Why do new networks use CAT 5E or CAT 6 rather than CAT 3?**

Because they are more stringent (less interference) and have a faster transfer rate.

1. **What are some disadvantages of CAT 5E and why is it used in so many installations?**

The only real disadvantage of CAT 5E is the fact that it can only carry information over 100 metres.

1. **What type of networks is this cable largely used in?**

This cable is primarily used in a star network.

**Coaxial Cable**

1. **Describe the characteristics of this cable.**

The coaxial cable contains only two wires and can carry 10 Mbps over 185 metres.

1. **What network is it used in?**

The Coaxial cable is most commonly used in bus networks, in which all of the data travels in both directions from the computer that created the data, because the cable carries the signal in both directions, this means that both incoming and outgoing wires from each computer are carried on the same wires. Thus, this creates a lot of network traffic and a device may have to wait some time before they can send a message.

**Fibre-optic cable**

1. **Describe the characteristics of this cable.**

This cable is constructed of special glass or plastic strands that have the ability to transmit via light pulses. The light is free from electromagnetic interference and can reliably carry data for up to two kilometres. The speed of a fibre optic cable relies on the quality of the light generator and receiver on the end of the strand.

1. **Why is fibre-optic cable often used to connect major switches inside buildings as well as between buildings?**

Because many organizations need higher speeds within their organization, i.e. a graphic design studio.

1. **What are the disadvantages of this cable?**

The major disadvantage of a fibre-optic cable is that it is only capable of sending one-way traffic. This is called simplex transmission. This is because the generator is at one end and the receiver at the other. When two way-traffic is needed, two separate strands are used.

**Wireless Transmission,** p 30

**Radio Waves**

1. **What is required for radio transmissions to occur?**

A transmitter is needed to broadcast the radio signal and a receiver is needed to accept it.

1. **Wi-Fi networks use radio waves. What are its advantages over a cable network and what are its disadvantages?**

The advantages of a wireless network seem fairly self-explanatory, they don’t require cables to connect a device to a network and can be used anywhere within the range of a WAP (wireless access point). The disadvantages of a Wi-Fi network are slower speeds and the fact that it is more susceptible to interference.

1. **Describe the characteristics of Bluetooth.**

Bluetooth is the standard that uses short-range radio waves to transmit data over 10 metres. The transfer rate is only 2 Mbps, but is useful to connect notebook computers in a meeting or to use in conjunction with hand-held computers, PDAs and phones.

**Microwaves**

1. **Describe the characteristics of microwave transmission.**

Microwave transmission can handle very high data rates over short distances (e.g. 4 Mbps over 5 kms). Microwave passes through earth’s atmosphere with less interference than longer wavelength radio waves. There is also more usable bandwidth in the microwave spectrum than in the rest of the radio spectrum.

1. **What are the limitations of microwave transmission?**

Microwave transmission requires line-of-sight transmission between the sending and receiving dish with no obstructions.

**Satellite**

1. **Satellite transmission can be in what forms?**

It can be in the form of radio waves or microwaves.

1. **What are the limitations of this form of transmission?**

The biggest limitation to this form of transmission is the distance the waves have to travel to the satellite and back to the earth station, this can mean that it can be quite expensive.

1. **Who might use this form of transmission?**

This form of transmission is commonly used in rural areas as other forms are usually out of range.

**Infra-red**

1. **Describe the characteristics of infra-red transmission.**

It uses the same technology as the TV and video remote controls. It is quite effective in ranges up to 5 metres. Infra-red transmission uses light waves to transmit data.

1. **Why is radio wireless networking preferable to infra-red wireless networking?**

There are a few reasons as to why radio wireless is preferred to infra-red; radio does not require line-of-sight transmission like infra-red, it has extended range (100 metres compared to 5 metres), and it is much quicker than infra-red technology.